PLIOCENE FRESH-WATER FOSSILS OF THE KETTLEMAN HILLS AND NEIGHBORING CALIFORNIAN OIL FIELDS

BY H. A. PILSBRY

Some time ago a collection of these interesting fossils was received from Mr. Stanley Siegfus, of the Shell Oil Company, with a request that they be reported on. An illustrated account has been prepared, but owing to causes beyond my control, publication has been delayed; it is expected to appear in the autumn. Meanwhile the following brief notices are given for temporary reference.

Goniobasis kettlemanensis woodringi, n. subsp. Similar to the type except that the whorls are more convex, and the spire has weak axial plication. It is from a higher zone, the basal Tulare formation.

G. arnoldiana, n. sp. Smooth except for some growth wrinkles, with rapidly tapering spire, attenuate above, and tapering faster than in *G. nigrina.* 14 × 7.2 mm., apert. 7 mm., or larger.

Calipyrgula, n. gen. (Hydrobiidae.) Minute, very slender, perforate, with slightly obtuse apex and strongly convex whorls, spirally striate. Type *C. carinifer.*

C. carinifer, n. sp. Shell carinate from the third whorl. 3.9 × 1.5, apert. 1 mm.; 7 whorls. 2.1 × 0.9, apert. 0.65 mm., 5½ whorls.

C. ellipsostoma, n. sp. Similar, but with rounded whorls which are less convex and a little longer, very weakly striate spirally. 3.4 × 1.2, apert. 1 mm.; 6½ whorls.

Pyrgulopsis vinctus, n. sp. Smaller than *P. nevadensis,* with a wider umbilicus; smooth. 3.7 × 2.2 mm., apert. 1.25 mm.; 5½ whorls.

P. polynematicus, n. sp. Shorter than *P. vinctus,* with a keel at shoulder and finely striate spirally; umbilicus moderately wide. 2.25 × 1.66 mm., apert. 1.1 mm.; 4½ whorls. Button-willow gas field, 2649 to 2660 ft.

Fluminicola kettlemanensis, n. sp. Imperforate or nearly so, resembling *F. virens* (Lea), but with a shorter aperture. 7.7 × 5.4 mm., apert. 4.2 mm. San Joaquin formation outcrop.

F. pilula, n. sp. Subperforate, nearly sphaerical, with very short, conic spire. Convexity of last whorl greatest near the suture; smoothish, with microscopic spiral striae. Columella

and parietal wall rather heavily calloused. 4.5 × 4.3 mm., apert. 3.25 mm. Lost Hills oil field, 435–445 ft.

F. siegfusi, n. sp. Globose, imperforate, the early whorls nearly in a plane, the apex slightly concave. Surface smooth. Columella and parietal margin very heavily calloused. 3.25 × 3.2 mm., 4½ whorls. Same loc., 365–720 ft.

F. spiralis, n. sp. Globose-conic to ovate-conic, perforate, rather thin, the apex only slightly obtuse; whorls convex, with delicate growth lines and minute engraved spiral lines. Columella very lightly calloused. 4.25 × 3.4 mm., apert. 2.25 mm. 23 miles southeast of Hanford, 772–792 ft., and in the McKittrick Front oil field.

F. perditicollis, n. sp. Globose with very shortly conic spire, smooth, the aperture rather strongly oblique, columella and parietal margin rather heavily calloused. 6.2 × 5.2 mm., apert. 4.7 mm.; 5 whorls. Lost Hills oil field, 455–650 ft.

F. percarinata, n. sp. Imperforate, trochiform, with a median keel on the last whorl, which is flattened above and below it; apex flattened. Columella rather heavily calloused. 4.8 × 4.3 mm., 4⅔ whorls. Same loc., 445–520 ft.

Brannerillus involutus, n. sp. Rather narrowly umbilicate, globosely truncate-conic with rounded periphery and very obtuse summit, the apex sunken; 3 whorls visible in a front view; smooth. 2.8 × 2.25 mm., apert. 1.45 mm., 4 whorls. Kettleman Hills, Sec. 30–21–17, outcrop of basal Tulare formation.

In the form *B. i. praeposterus,* n. subsp., the spire shows only 2 whorls in front view, and the summit is flat or convex, not sunken. It is also smaller.

Littoridina woodringi, n. sp. Narrowly perforate, acutely oblong-conic, the spire straight sided or slightly attenuate above, the whorls only moderately convex, smooth; aperture oval. 3.4 × 2, apert. 1.35 mm.; 5½ whorls. E. side Middle Dome, Kettleman Hills, 350 ft. above the base of the Tulare formation.

Amnicola hannai, n. sp. Narrowly umbilicate, acutely ovate-conic, the spire straight sided, of 5 strongly convex short whorls; smooth; aperture oval. 2.7 × 1.8, apert. 1.1 mm. Many specimens (males?) are more slender, 2.5 × 1.5 mm. It is smaller than *A. longinqua* Gld., which is abundant in the Kettleman Hills Pliocene, with more acute, straightly conic spire.

Valvata densestriata, n. sp. Similar to *V. h. californica,* but the whorls increase more rapidly in caliber, and the surface is very finely, closely and sharply striate. 4.2 × 4.5 mm., apert. 2.4 mm.; 3½ whorls. Well about 23 miles southwest of Hanford, 772–792 ft.

Helisoma (?) *kettlemanensis,* n. sp. Minute, resembling *H. anceps* (Mke.) in general form except that it is not carinate; left side more deeply and narrowly umbilicate than the right, periphery rounded; aperture large, oblique and triangular-lunate. Diam. 2.8 mm., alt. 1.7 mm.; nearly 3 whorls.

NEW LYMNAEIDAE FROM THE UNITED STATES AND CANADA: I. CALIFORNIA, OREGON AND OTHER WESTERN STATES

BY FRANK C. BAKER

When the writer's "Lymnaeidae of North and Middle America" was published in 1911 it was thought that the limit had been reached in the number of species of this family in North America. The more conservative critics of this work believed that too many species had been admitted as recognizable, and that in time some of these would become synonyms. Such, however, has not been the case, for during the twenty-two years which have passed since its publication nearly a dozen new species and races have been added. Studies on material recently received from Canada and the western United States indicate quite clearly that a considerable number must still be added. It is proposed to diagnose these new forms in a series of papers of which this is the first.

That indefatigable worker and keen observer Professor Junius Henderson has been overhauling the Hemphill and Hannibal collections of fresh-water mollusks in the museum of the Leland Stanford University, and has unearthed a number of Lymnaeas which do not fit into any of the species known at present, and it becomes necessary to affix new names to them.

Stagnicola palustris magister nov. var. Vol. 47, pl. 14, fig. 1.

Shell differing from *S. p. nuttalliana* in being larger, with a longer spire, deeper sutures, the penultimate whorl large and "puffy," the aperture rounder and more or less arched at the posterior angle. There are fully seven whorls. *Nuttalliana* usually has only six full whorls.